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(54) TOUCH POINT RECOGNITION METHOD OF TOUCH SCREEN AND SYSTEM PERFORMING THE SAME

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CPC . G06F 3/041–3/0428; G06F 3/0488–3/04886; G06F 2203/04104; G06F 3/03547

See application file for complete search history.

(56) References Cited

(10) Patent No.:

U.S. PATENT DOCUMENTS

6,323,846 B1*	11/2001	Westerman G06F 3/0235
2007/0100274	5/2007	345/173
2007/0109274 A1*	5/2007	Reynolds G06F 3/041 345/173
2009/0295756 A1*	12/2009	Shamaie G06K 9/00355
2012(010222	= (2012	345/175
2012/0182238 A1*	7/2012	Lee G06F 3/0418 345/173

FOREIGN PATENT DOCUMENTS

JP	2012-073659	Α	4/2012
JP	2012-098987	Α	5/2012
KR	10-2012-0071230	Α	7/2012

^{*} cited by examiner

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(57) ABSTRACT

A touch point recognition method of a touch screen includes touching a palm on one surface of a screen and sensing a palm area from the other surface of the screen. Finger touch areas are extracted from the sensed palm area by using a bandpass filter, a finger area is extracted from the palm area by using an image processing filter, and a palm center area is extracted from the palm area by using a lowpass filter. The finger touch areas are grouped based on the finger area, and a finger touch area, which is distant from the center area in the group of the finger touch areas, is recognized as an actual touch area.

14 Claims, 9 Drawing Sheets

